Space Weather Forecast

Issued on Friday, 12 August 2022 at 00:20 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Geomagnetic activity lessening.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been low over the past 24 hours, with the largest X-ray flare a bottom-end common class flare at 11/0657UTC from a developing sunspot group in the southwestern quarter of the Sun. The other group of note occupied the northeast, comprising the long-term large southern spot but also a newly-developed northern cluster. These were two of five sunspot regions on the current Sun, with the remainder all stable magnetically bipolar or else unipolar groups. At the very end of the period a possible sixth sunspot - a new bipolar region - was also seen to develop near the meridian in the southern solar hemisphere.

No Earth-directed Coronal Mass Ejections (CMEs) were in evidence in available satellite imagery, this despite the long-period common-class X-ray flare described above (sometimes symptomatic of a CME).

Solar Wind / Geomagnetic Activity: Earth appears to be transiting a region of space between fast wind streams at present, with an elevated solar wind, but overall showing a slight fall. The number of particles comprising the solar wind rose over the same period, finishing slightly above long-term background. The magnitude of magnetic field rose to become slightly elevated, with the north-south component of this field more often anti-aligned with Earth's field than not (to greater geomagnetic effect).

The net result of the above solar wind measures was a general increase in geomagnetic activity, from mainly quiet to just shy of Minor Storm G1, peaking in the 15-18 and 18-21UTC intervals as a period of more prolonged anti-alignment of the magnetic field of the solar wind and Earth brought itself to bear.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to be low, with a daily slight chance of moderate-class flares chiefly due to development in two of the current five sunspot regions. There appears to be at least one possible sunspot region that may shortly arrive over the eastern solar horizon that may slightly bolster the risks of flares, but this will be assessed as and when it appears. There is otherwise a daily slight chance of moderate-class X-ray flares throughout - given the main active sunspot should persist on the front side through the period.

Solar Wind / Geomagnetic Activity: No CMEs feature in the current forecast.

Solar wind speeds are expected to peak at the start of the four-day period, with a possible entry into the final of a series of three fast wind streams due imminently. The solar wind and resultant

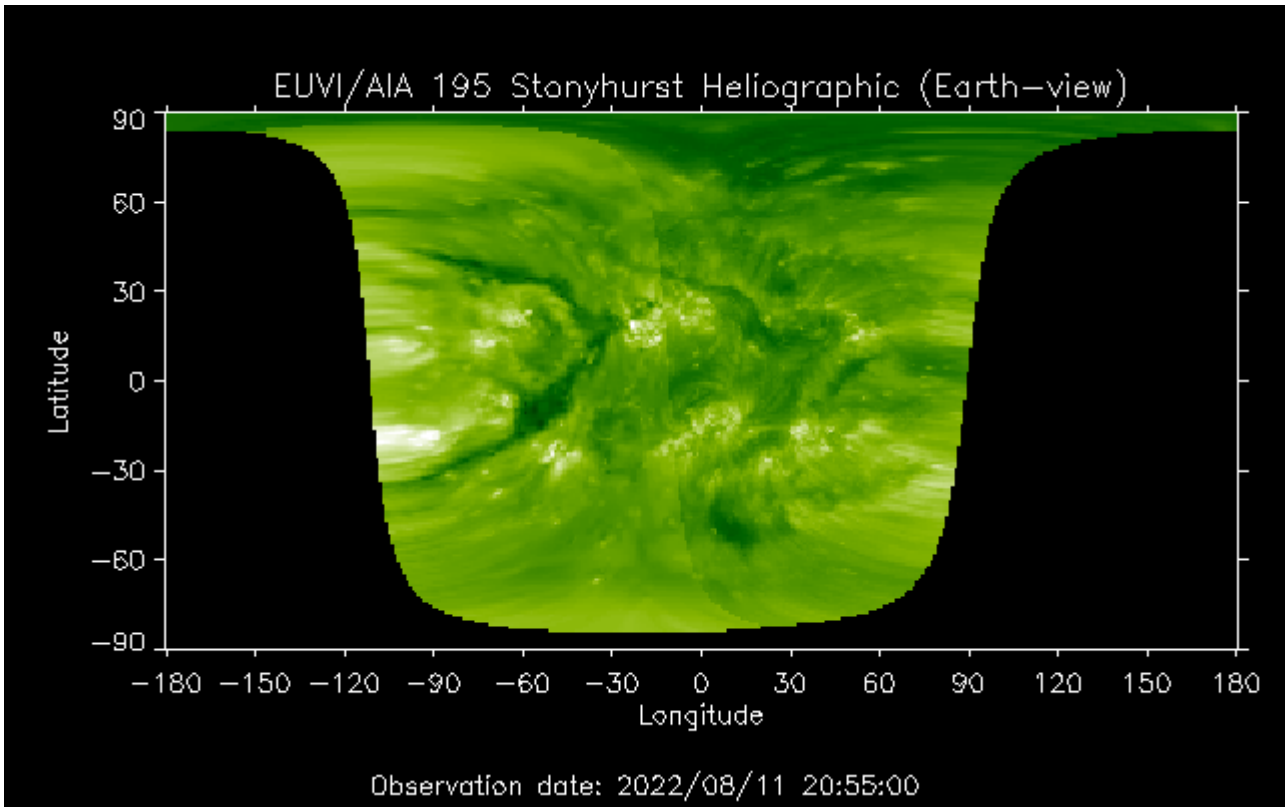
Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2022. All Rights Reserved.

geomagnetic activity should decline into the coming UTC weekend, such that it should become more reliably quiet through Saturday 13 August, from an early peak slight chance of Minor Geomagnetic Storm G1.

Energetic Particles / Solar Radiation: No solar radiation storms are expected given the dearth of significant active sunspots.

Figure 1: False-colour extreme UV cylindrical projection the Sun, showing a prospective new bright flux region narrowly over the southeastern solar horizon, a feature that may correlate with a sunspot group.



Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	1	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2022. All Rights Reserved.

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	5	5	5	5
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2022. All Rights Reserved.